Global Changes needed based on LWG issues:

1. Need to remove the word "hypothetical" from all text, tables, figures, and appendices.
2. Need to consistently refer to "potentially" complete pathway throughout document.
3. Need to update cumulative risk tables to be included in BHHRA.

Table 1: LWG List of Priority Issues on EPA's June 22, 2012 Version of BHHRA that Require Discussion with EPA

LWG Issue #	EPA Position	Section/page	EPA Proposed Change
Issues Related to Study Area Boundary			
1a	EPA is withdrawing this comment		Do not make changes to these tables.
1b	Agree		
1c	Agree		
1d	Add	1.0/24	Major LWG data collection efforts occurred during four sampling rounds in the ~~Remedial Investigation/Feasibility Study (RI/FS) Study Area~~Willamette River (RM 0.8 to 12.2) to characterize the physical system
Issues Related to Fish Consumption Scenarios			
2a	Disagree		Language remains unchanged.
2b	Disagree		Language remains unchanged.
2c	Disagree		Language remains unchanged.
2d	Agree		"recreational" needs to be changed to "recreation"
2e	Agree		Need to do global search and insert "potentially" for all complete pathways.
2f	Agree		Need to do global search and insert "potentially" for all complete pathways.
2g	Agree		
2h	Partially Agree Sentence 1 - Agree Sentence 2 - Disagree	3.3.5/50	Sentence 2 - Language remains unchanged.
2i	Disagree		Language remains unchanged.
2j	Disagree		Language remains unchanged.
2k	Disagree		Language remains unchanged.
2l	Disagree		Language remains unchanged.
2m	Disagree		Language remains unchanged.
2n	Disagree		Language remains unchanged.
Issues Related to Drinking Water Scenario			
3a	Disagree		Language remains unchanged.
3b	Disagree		Language remains unchanged.

		6.2.2.3	"Additionally, although domestic water supply is a designated beneficial use of the Willamette River, OAR 340-041-0340 Table 340A defines the beneficial use only with adequate pretreatment. Thus, it is unlikely that individuals at households receiving water from the city would be exposed to contaminants at concentrations greater than the MCL. As presented in Section 5.2.8, cPAHs and MCPP are the only COPCs that posed an estimated cancer risk greater than 1 x 10^{-4} (cPAHs) or a noncancer hazard greater than 1 (MCPP). The uncertainties associated with assessing dermal exposures to dissolved PAHs are discussed further in Section 6.2.4.2. Although there is no MCL established for MCPP, the associated HQ is greater than 1 at only one of the locations evaluated, W035, located at RM 8.5, where the estimated hazard is 2. ~~Therefore, the evaluation of surface water as a domestic water source is a conservative approach and is not based on current knowledge of future planned uses of the Willamette River within the Study Area as a domestic water.~~"
3c	Partially Agree		
Issues Related to Clam Consumption Scenario			
4a	Disagree		Language remains unchanged.
4b			
4c	Partially Agree		For all four, can only add statement that there is no risk greater than 10^{-4}
4c			
4d			

	Partially Agree	6.2.2.1	"DEQ and EPA staff have occasionally received calls from individuals who claim to have harvested clams and are inquiring whether consumption is safe, and individuals ~~of apparent southeast Asian descent~~ have been observed harvesting clams from the shore in Portland. However, the predominant species found in the LWR during sampling events were Asian clams (Corbicula), which are an invasive, non-native species. Oregon law (OAR 635–056–0050) prohibits the possession, transportation, and sale of non-native wildlife, and the actual extent to which freshwater clams or other shellfish are currently harvested from Portland Harbor and consumed is not known."
4e			

Issues Related to Summary of Risks

5a	Agree		

Table 2: LWG Comments on EPA's June 22, 2012 Version of BHHRA

LWG Issue #	EPA Position	Section/page	EPA Proposed Change
1	Partially Agree	General	LWG needs to specifically identify section numbers and references needing correction for EPA approval.
2	Partially Agree	General	LWG needs to specifically identify incomplete the sentences and proposed modifications for EPA approval.
3	Partially Agree	General	LWG needs to specifically identify instances of typos and grammatical errors that require correction for EPA approval.
4	Partially Agree	General	LWG needs to provide specific locations and need to discuss extent of inclusion in BHHRA.
5	Disagree	Tables 57-62	Need to remove the word "hypothetical"
6	Agree	List of Tables	The tribal fisher risk tables will be included.
7	Disagree (see Table 1 Issue #2)	List of Tables	Language remains unchanged. Need to discuss options.
8	Agree	1.0/24	The last sentence in the first paragraph will be revised to: "...potential ~~exposures~~ baseline human health risks..."
9	Disagree	1.1/24-25	Language remains unchanged.
10	Agree	1.2/25	The first sentence of the second paragraph will be revised to: "Potential exposure pathways, populations, and exposure assumptions were originally identified in the Programmatic Work Plan and in subsequent directions from EPA."
11	Agree	2.1.6/33	The following sentence should be modified as indicated: "As previously noted, two samples were collected from ~~each~~ five of the sampling stations in Round 3, one sample from each station was depurated prior to analysis, the other was analyzed undepurated. At the remaining stations, only undepurated samples were analyzed."
12	Agree	2.1.6/33	The following sentence should be added: "Depuration is a common method for cleansing shellfish that is often done prior to human consumption to eliminate the sediment present in the gastrointestinal (GI) tract of the shellfish."
13	Disagree	2.3.2/40	Language remains unchanged.
14	Disagree	3.2/43	Language remains unchanged.
15	Disagree	3.2.1.3/44	Add reference: Sheldrake S., D. Davoli, M. Poulsen, P. B. Duncan, E. R. Pedersen, 2009, Diver Exposure Scenario for the Portland Harbor Risk Assessment. Proceeding of the American Academy of Underwater Sciences 28th Symposium. pp. 7-13. (PDF) (17 pp, 585K)

16	Disagree	3.2.1.3/44	Add reference: Sheldrake S., D. Davoli, M. Poulsen, P. B. Duncan, E. R. Pedersen, 2009, Diver Exposure Scenario for the Portland Harbor Risk Assessment. Proceeding of the American Academy of Underwater Sciences 28th Symposium. pp. 7-13. (PDF) (17 pp, 585K)
17	Disagree	3.2.1.8/46	Language remains unchanged.
18	Agree	3.3.2/48	The last sentence should be revised as follows: "Exposure to in-water sediment was evaluated throughout the Study Area by half river mile segments on either side of the river rather than at specific areas as was done with exposure to beach sediments."
19	Partially Agree	3.3.3/48	The following sentence should be added to the first paragraph: "Surface water was also evaluated as a potential future domestic water source due to the designated beneficial use of the LWR for domestic consumption ~~following adequate pretreatment~~." The last sentence of the first paragraph should be revised as follows: "Accordingly, direct exposure via ingestion and dermal contact with surface water is considered to be a potentially complete pathway for transients, recreational beach users, and divers, and future domestic water users."
20	Partially Agree	3.3.7/49	"Lipid-soluble chemicals can accumulate in body fat, including lipids found in breast-milk. As a result, breast-feeding represents a potentially complete exposure pathway for nursing infants. Accordingly, infant exposures to PCBs, dioxins/furans, DDx, and PDBEs were evaluated as a potentially complete exposure pathway wherever maternal exposure to those compounds was evaluated.~~Lipid-soluble chemicals accumulate in body fat, including lipids in breast milk. Breast-fed infants can then be exposed to these chemicals. Infant exposure to PCBs, dioxins, DDx compounds, and PDBEs via the consumption of human milk was evaluated as a complete exposure pathway for the children of all receptors.~~"
21	Agree	3.4/50	The fourth sentence of the first paragraph should be revised as follows: "Because of the uncertainty associated with estimating the true average concentration at a site, EPA guidance (EPA 1989, 1992) notes that the 95 percent upper confidence limit (UCL) of the arithmetic mean should ~~always~~ be used for this variable."

22	Partially Agree	3.4/50	Need to provide modified language.
23	Agree	3.4.5/53	The second sentence of the second paragraph should be revised as follows: "Common carp, black crappie, and brown bullhead were collected and composited within river segments designated as fishing zones, which are generally consistent with the home ranges identified in the Programmatic Work Plan ~~which are largely based on the home range of the fish as determined in a study of anadromous fish in the LWR by the Oregon Department of Fish and Wildlife (ODFW 2005)~~."
24	Partially Agree	3.5/54,60	Change ADD to CDI.
25	Disagree	3.5/54-62	Language remains unchanged.
26	Disagree	3.5.2.1/57	Language remains unchanged.
27	Partially Agree	3.5.3/58	EV needs to be defined.
28	Partially Agree	3.5.3/58	Need to fix equation.
29	Disagree	3.5.5/59	Language remains unchanged.
30	Disagree	3.5.10/63	Language remains unchanged. (see section 3.5.10.8)
31	Agree	3.5.10.1/63	The first and second sentences should be revised as follows: "Exposure frequency for dockside workers was assumed to be ~~20~~50 days/year for the RME evaluation, and ~~50~~44 days/year the CT evaluation. The RME value assumes a dockside worker is exposed to beach sediment one day per week for 50 weeks (the EPA default exposure frequency of 250 days/year for a worker assumes 50 weeks of exposure in a year). ~~The value of 200 days/year is slightly less than the EPA default exposure frequency of 225 days/year for outdoor workers, and represents the average number of days worked per year according to the U.S. Census Bureau's 1990 Earnings by Occupation and Education Survey.~~"
32	Partially Agree	3.5.10.3/64	The second sentence of the second paragraph should be revised as follows: "Dermal exposure of divers wearing a wet suit to sediment was evaluated assuming the entire skin surface area was exposed."
33	Agree	3.5.10.5/65	The first sentence of the last paragraph should be revised as follows: "Water temperatures in the Lower Willamette River would typically limit swimming to the summer months, thus swimming was assumed to occur at a rate of 26 days per year for adults and 65 days per year for children for RME estimates."
34	Disagree	3.5.10.7/68	Language remains unchanged.
35	Agree	4.7/78	RfDo will be defined as the oral reference dose.

36	Partially Agree	5.1.1	Language remains unchanged. CDI will be used in document rather than ADD (or ADI) - need to correct in Section 3 (see comment #24)
37	Partially Agree	5.2/83-93	LWG needs to specifically identify cancer risks and hazards needing correction for EPA approval.
38	Agree	5.2.6.1/85	The following sentence will be added after the first sentence in each paragraph: "For beach sediment, noncancer hazards are less than 1."
39	Disagree	5.2.6.2/86	The following clause will be added at the beginning of the next sentence: "For in-water sediment,…" Language remains unchanged.
40	Disagree	5.2.6.2/86	Language remains unchanged.
41	Disagree	5.2.6.3/87	Language remains unchanged.
42	Partially Agree	5.2.6.3/87	Dioxins/furans were not analyzed in fillet, only in whole body. Need to provide language.
43	Agree	5.2.6.6/90	DDx will be delected as a primary contributor to risk for the multi-species diet.
44	Partially Agree	5.2.6.7/91	~~Although cPAHs~~Dioxins/furans and PCBs are generally the primary contributors to the overall hazard~~, cPAHs are the primary contributors to the hazard estimates at RMs 5W and 6W~~.
45	Disagree	5.2.7.2/92	The LWG comment relates to hazard while the resolution relates to risk. The statements in the BHHRA are correct. Language remains unchanged.
46	Agree	5.3/93	"in-water sediment" will be deleted from the transient bullet.
47	Partially Agree	5.4/94	The highest relative cumulative risk or hazard estimates are at RM 2, RM 4, RM 7, Swan Island Lagoon, and RM 11. However, assuming exposure to sediment alone, areas posing the greatest risk are RM 6W, RM 7W, RM 8.5W, and RM ~~11~~5E, shellfish consumption alone poses the greatest risks at RM ~~4~~3E, RM 5W, RM 6W, 7W, ~~and~~ RM 6E, and 11E.
48	Disagree	6.0/95	Language remains unchanged. (note: LWG cited incorrect guidance)
49	Disagree	6.1.2/96	Language remains unchanged. (note: Reference to contaminant concentrations in rivers in another state irrelevant and insufficient support to sources of chemicals outside the Study Area that contribute to the Study Area.)
50	Agree	6.1.4/97	The first sentence should be revised as follows: "Only a limited number clam tissue samples (five of 22) collected in the Study Area were ~~not~~ depurated prior to analysis."
51	Disagree	6.1.6/98	Language remains unchanged.

52	Partially Agree Sentence 1 - Agree Sentence 2 - Disagree	6.1.10/99	The second sentence should be revised as follows: “For example, fillet samples collected in Round 1 were analyzed for PCB as Aroclors, but no analysis was done for dioxins and furans.” The last sentence of the same paragraph remains unchanged.
53	Partially Agree	6.2.2/102	Need to provide modified language.
54	Partially Agree	6.2.2.1/103	"...and individuals ~~of apparent southeast Asian descent~~ have been observed harvesting clams from the shore in Portland."
55	Agree	6.2.4.3/107	The sentence following the first bullet list should be modified as follows: “In addition to the consumption rates, uncertainty also exists with respect to the relative percentage of the diet of obtained from the Study Area or within individual exposure areas versus other nearby sources of fish”
56	Agree	6.2.5.1/108	The following sentence will be added: “The 95% UCLs calculated using less than 10 samples are presented in Appendix F2.”
57	Disagree	6.2.5.5/110	"Tissue concentrations of arsenic were reported as total arsenic, which is consistent with EPA toxicity criteria~~, which are based on total arsenic~~."
58	Agree	6.4.3/118	LWG needs to provide specific language for EPA approval.
59	Agree	7.0/121	The first sentence of the second paragraph should be modified as follows: “The populations evaluated in the BHHRA were identified based on human activities currently known to occur within the Study Area or could occur in the future, as described in the Programmatic Work Plan or in subsequent direction from EPA.”
60	Disagree	7.2/122	Change title of section 7.2 to "Selection of Contaminants of Concern"
61	Agree	7.2.3/127	The fourth sentence should be modified as follows: “~~Throughout the~~ On a Study Area-wide basis, estimated risks from cPAHs and dioxins/furans each contributed approximately 50 percent of the cumulative cancer risk estimate.”
62	Disagree	7.2.1/123	Document is not able to stand alone - too many references to RI. Summary of Risk Assessment will be provided in RI . Risk assessment conclusions are provided in both Sections 5 and 7 of the BHHRA.